

Appendix U

Acoustic Assessment

File Ref: AC25307 – 02 – R2

19 December 2025

Duncan White
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Email: Duncan.White@patersons.co.nz

Dear Duncan,

**Re: Mt Iron Junction Mixed Use Development, 237 Wanaka – Luggate Highway, Wanaka
Assessment of Environmental Noise Effects**

As requested, we have undertaken an Assessment of Environmental Noise Effects (AENE) for the Mt Iron Junction mixed use development at 237 Wanaka – Luggate Highway (**Project**), in Wānaka to support the Substantive Application to be lodged under the Fast-Track Approvals Act 2024 (**FTAA**). This assessment considers the environmental noise emitted by the Project.

Our analysis is based on the following documentation:

- Development plans titled *Mt Iron Junction – Fast Track Application, for Mt Iron Junction LTD*, as prepared by DCM Urban, and dated the 24th of June 2025.
- Subdivision scheme plan titled *Mount Iron Junction – Subdivision Scheme Plan*, as prepared by Patersons, and dated the 9th of October 2025.
- Development layout as received via email with subject title *RE: [PAT P240103] Mt Iron Junction - Acoustic Assessment for Fast Track Application – Approval*, as sent by Duncan White of Patersons, and received on the 15th of October 2025.

Please find our analysis and recommendations below.

1.0 BACKGROUND

1.1 Site and surrounding area

The site is located on the corner of State Highways 6 and 84, in Wānaka and is outlined in red in figure 1.1 below. This application relates to the sections at 10 Mountain Road and 37 Albert Town Lake Hawea Road with legal descriptions Lot 2 and Lot 6 DP605028 and Lot 3 DP359869. The site is located within a Rural Zone as defined by the Proposed Queenstown Lakes District Plan, with the surrounding sites zoned Rural, Large Lot Residential A, Rural Residential and Rural Lifestyle as shown in figure 1.1.

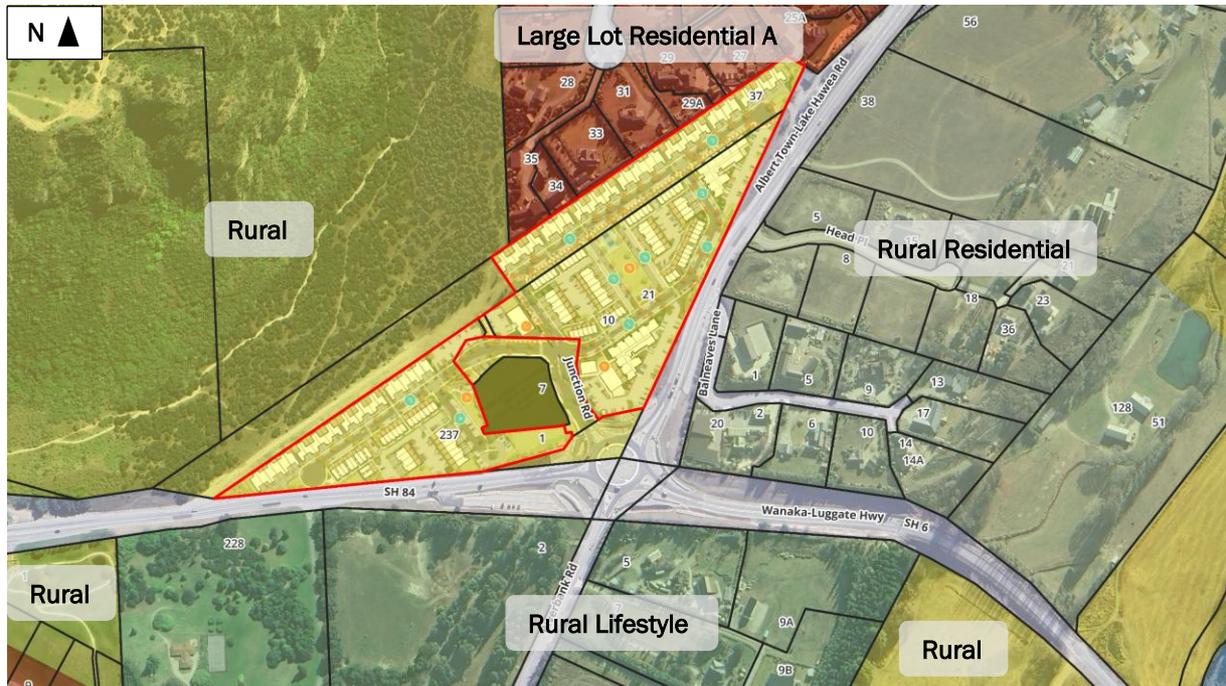


Figure 1.1 – Site and surrounding area

1.2 Proposal

The Project seeks approvals to develop the site into a comprehensive and integrated mix of residential, commercial, and recreation activities. Parts of the development have already been approved by resource consent RM181471 including parts of the roading network and the subdivision of the Service Station site at 7 Junction Road. For clarity the service station does not form part of the Project under the FTAA and forms part of the existing legal environment.

We understand that the intention is to subdivide the site to provide roading, so that most residential units will be located on a separate title that includes a carparking space. At the northern end of the wider site is a 3050 m² site that appears to contain several residential units in a single building. The proposed site and development scheme are shown in figures 1.2 and 1.3 below.

We expect the dominant noise generating activities proposed will be as follows:

1.2.1 Café and Market

A Café and Market are to be located on Lot 101 of the development, immediately north of the Mt Iron Roundabout, as shown in figure 1.2 below as Location D.

The Café will operate within a building with a 154 m² footprint, with a 50 m² outdoor seating area to the east of the building.

The Market is located with a building with a 275 m² footprint. We understand that the Market is to operate as a small-scale boutique fresh fruit, vegetation and meat market.

We understand that a parking lot with 25 carparking spaces is to service both the Café and Market activities.

The operation of the Café and Market is yet to be finalised, but we understand typical activity associated with the Café and Market can realistically be contained between 0800 – 2000 hours.

1.2.2 Childcare Centre for up to 65 children

A Childcare Centre for up to 65 children is to be located on Lot 100 of the development, as illustrated in figures 1.2 and 1.3 below (Location C in figure 1.2).

We understand that a parking lot with 15 carparking spaces is to service the Childcare Centre.

The operation is yet to be finalised, but we understand that the Childcare Centre will be open between 0800 – 2000 hours, however it is likely that staff may be present onsite from 0700 – 2200 hours.

1.2.3 Pickleball court

A pickleball court is to be located on Lot 802 of the development, as illustrated in figures 1.2 and 1.3 below (Location B in figure 1.2).

It is anticipated that the use of the pickleball court will be intermittent throughout the day. Noise associated with play is expected to occur in short, active sessions, with quieter periods when the court is not in use.



Figure 1.2 - Site plan

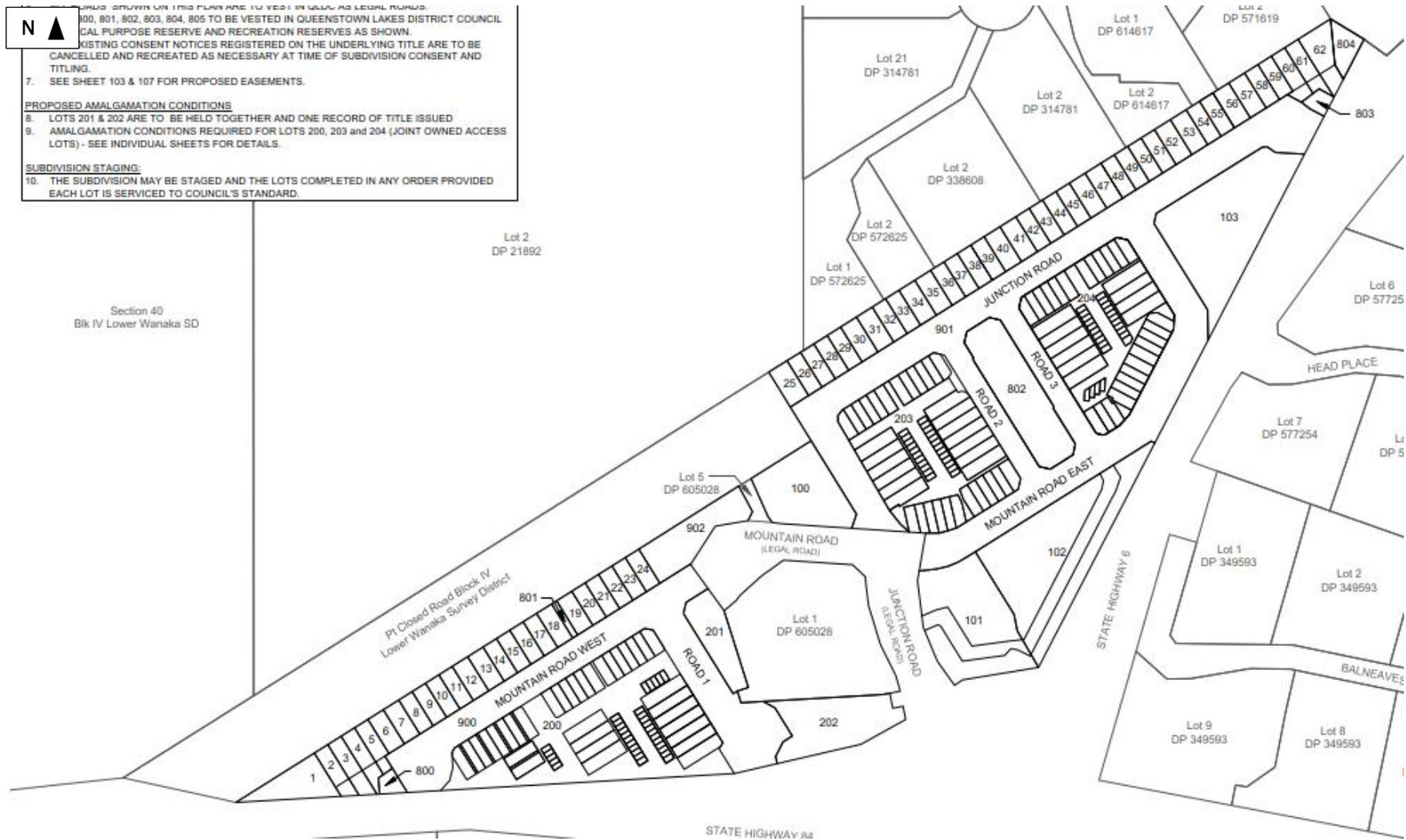


Figure 1.3 – Development subdivision plan

2.0 ACOUSTIC CRITERIA

The FTAA requires consideration of the actual and potential effects associated with the proposal on the environment. Guidance as to the significance of any adverse noise effects may be obtained from several sources.

2.1 Proposed Queenstown Lakes District Plan

We understand that appeals of the relevant sections of the Queenstown Lakes Proposed District Plan (QLPDP) are now beyond challenge and thus the noise rules under the QLPDP are deemed to be operative.

The QLPDP noise standards can be found in Chapter 36 of the QLPDP and are reproduced below for the relevant zones. Activities that breach these standards and do not have an exemption are deemed non-complying with regard to noise.

Table 2.1 – QLPDP Noise limits

Zone sound is received in	Assessment location	Time (hours)	Noise Limits
Rural	Any point within the notional boundary of a residential unit.	0800 – 2000	50 dB $L_{Aeq(15min)}$
		2000 – 0800	40 dB $L_{Aeq(15min)}$ 75 dB L_{AFmax}
Rural Residential Rural Lifestyle Large Lot Residential A	Any point within any site	0800 – 2000	50 dB $L_{Aeq(15min)}$
		2000 – 0800	40 dB $L_{Aeq(15min)}$

The QLPDP also states that noise shall be measured and assessed in accordance with NZS 6801:2008 *Acoustics – Measurement of environmental sound* and NZS 6802:2008 *Acoustics – Environmental noise*.

2.2 New Zealand Standard 6802

NZS 6802:2008 *Acoustics – Environmental noise* outlines a guideline daytime limit of 55 dB L_{Aeq} (15 minute) and a nighttime noise limit of 45 dB L_{Aeq} (15 minute) for “the reasonable protection of health and amenity associated with the use of land for residential purposes”. A nighttime noise limit of 75 dB L_{AFmax} is outlined in the Standard with no L_{AFmax} limit during the daytime period.

We note that the Standard provides guidelines in section 8.3 regarding ‘daytime’ and ‘nighttime’ for use in situations where these are not specified. The timeframe recommended is 0700 to 2200 hours for daytime, and 2200 to 0700 hours for nighttime.

NZS 6802:2008 also describes the application of a penalty for noise containing Special Audible Characteristics (SAC). In cases where SAC are confirmed to be present, the adjustment is +5 dB.

The Standard also describes how a - 1 dB duration/averaging adjustment may be applied to sound received for less than 80 % of the daytime period, a - 2 dB duration/averaging adjustment may be applied to sound received for less than 60 % of the daytime period, and a - 3 dB duration/averaging adjustment may be applied to sound received for less than 50 % of the daytime period.

In mixed use zones, NZS 6802:2008 notes that it can be challenging to define noise limits that fulfil the intent of the area but also protect amenity values. A daytime limit of 60 dB L_{Aeq} is suggested, in combination with other controls (for example sound insulation of dwellings).

2.3 World Health Organisation

*Guidelines for Community Noise*¹, a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB L_{Aeq} to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB L_{Aeq} is recommended to prevent moderate annoyance.

A guideline nighttime limit of 45 dB L_{Aeq} is recommended to allow occupants to sleep with windows open. The document also offers a guideline limit of 30 dB L_{Aeq} within bedrooms to avoid sleep disturbance.

These guideline noise levels are measured at the façade of dwellings and other noise sensitive locations and apply for 16 hours in the daytime, and 8 hours for the nighttime.

2.4 Existing ambient traffic noise environment

As the site has boundaries with both State Highway 6 and State Highway 84, many of the areas in the development, and on the opposite site of the State Highway will be exposed to elevated traffic noise levels. Predictions for traffic noise and the underlying assumptions are presented in section 4.0 – although these are based on future traffic volumes, and a road surface correction that may be conservative, and according to the *NZTA Guide to assessing road-traffic noise*, the road corrections used in the modelling “are expected to contribute 1-2 dB in the direction of overprediction”.

Current traffic noise levels could therefore be in the order of 4 – 5 dB lower than these predicted future values, or 61 – 64 dB $L_{Aeq(24\text{ hr})}$ at facades that are 25 – 35 metres from State Highway 6 and 67 – 71 dB $L_{Aeq(24\text{ hr})}$ at facades that are 25 – 35 metres from State Highway 84.

2.5 Discussion regarding appropriate noise levels

Based on the above, we observe that the operative District Plan daytime noise limit of 50 dB L_{Aeq} and nighttime limit of 40 dB L_{Aeq} / 75 dB L_{AFmax} for the Rural zones is more stringent than the upper guideline noise limits discussed in NZS 6802:2008 and WHO Guidelines including in terms of hours assigned to the daytime period.

We therefore consider that compliance with the QLPDP noise limits at the notional boundary of any residential units within a Rural Zone, and at any point within any site located within Rural Residential, Rural Lifestyle, and Large Lot Residential A Zones will ensure that the effects of the noise emissions are minimal.

Where daytime noise levels exceed the District Plan limits but remain below the NZS 6802 and WHO Guidelines value of 55 dB L_{Aeq} , this noise would also be expected to have minimal effect when received at nearby boundaries of noise sensitive properties – particularly those that are already exposed to existing traffic noise levels that are higher than this. For locations within the application site, where levels are higher again, but sound insulation controls will be provided to ensure appropriate internal noise levels (from site noise and off-site traffic noise), noise effects may also be minimal.

3.0 NOISE GENERATED BY THE ACTIVITY

As outlined above, we expect that the dominant non-residential noise generating activities associated with the development will be:

- Childcare centre (outdoor play)
- Pickle ball court
- Vehicles using commercial car parks (engine noise, road/tyre noise, doors slamming, and the like).

¹ Edited by Berglund, B et al. *Guidelines for community noise*. World Health Organization 1999.

- Mechanical plant noise associated with the Market and Café including outdoor chillers, condensers and extract systems.

We have undertaken analysis to predict noise levels at relevant assessment locations based on the following activity and sound powers associated with operation of the above:

- For the Childcare Centre, the number of children over 2 years old and under 2 years old is not specified at this stage. We have based our analysis on an effective sound power level of 95 dB L_{WA} for all 65 children in the outdoor area for a worst case scenario. This has been calculated from a sound power of 87 dB L_{WA} for a group of ten children, as given in the *Association of Australasian Acoustical Consultants Guideline for Child Care Centre Acoustic Assessment* version 3.0 for over 2 year olds and our analysis is conservative as under 2 year olds are on average 5 dB quieter.
- Expected noise emissions from the pickle ball court have been modelled as a with a sound power of 89 dB L_{WA} , based on our previous experience from observations of similar facilities, and the British Columbia Recreation and Parks Association acoustic report titled *Pickleball Noise Assessment*.
- Expected noise levels due to the conversation of customers in the outdoor dining areas have been based on the American National Standards Institute Standard ANSI S3.5 – 1997 *Methods for calculation of the Speech Intelligibility Index*, which contains information on the typical speech levels for both male and female speakers. Based on average values, for a normal voice effort, the sound power of a speaker may be deduced to be 68 dB L_{WA} .
- We understand that the Childcare Centre is to have 15 carparks, and the Market and Café are to have a total of 25 carparks. We have based our calculations on a worst-case scenario where each carpark fills and empties in a 15-minute period.
- We have also considered maximum (L_{AFmax}) noise levels generated by door slams, engine vehicles moving slowly on site, based on a maximum sound power of 98 dB L_{WAFmax} .
- A loading bay is to be located within the carpark immediately to the south of the Market. Delivery vehicles have been modelled with a sound power of 90 dB L_{WA} , travelling at 10 km/h to the loading bay southeast of the Café and Market building. Refrigerated delivery vehicles in idle have been modelled at 100 dB L_{WA} during unloading to represent a worst-case scenario.

3.1 Noise from activities on site during the daytime period (0800 to 2000 hours)

During the daytime period between 0800 to 2000 hours, we have based our analysis on the following level of activity, as a worst case scenario across the wider site:

Childcare Centre:

- All 65 children playing in the outdoors area of the centre.
- The 15 space carpark completely emptying and refilling in 15 minutes.

Café and Market:

- 20 Café patrons in the outdoors area with half speaking in normal voices.
- The 25 space carpark completely emptying and refilling in 15 minutes.
- One refrigerator truck navigating the carpark and unloading in a 15 minute period.

Pickle Ball Court:

- Court in use with two teams on the court.

3.1.1 Expected daytime noise levels at sites outside the development

Based on the above described noise sources and activity levels, the predicted noise levels at locations outside the development site are shown in table 3.1 below.

Table 3.1 – Noise levels from activities between 0800 and 2000 hours in a peak 15 minute period

Receiver location	Receiver Zone	Assessment location and limit	Expected noise levels (dB L _{Aeq})
1 Balneaves Lane	Rural Residential	Site boundary 50 dB L _{Aeq(15min)}	52
2 Balneaves Lane / 20 Albert Town-Lake Hawea Road			55
5 Balneaves Lane			47
5 Head Place			46
2 Riverbank Road	Rural Lifestyle		49
5 Riverbank Road			50
33 Old Racecourse Road	Large Lot Residential A		30
34 Old Racecourse Road			32
35 Old Racecourse Road			35

Based on this analysis, we expect the noise levels received at the boundaries of the residential units on the neighbouring sites can comply with the District Plan daytime noise limit of 50 dB L_{Aeq} except at 1 Balneaves Lane (a church) and 2 Balneaves Lane / 20 Albert Town-Lake Hawea Road (a veterinary clinic) which receive noise levels of up to 52 – 55 dB respectively.

These higher noise levels are primarily due to the use of the loading bay and deliveries to the Café and Market. As discussed above, we consider this will have a minimal effect, primarily because these locations are already exposed to elevated traffic noise levels from the adjacent State Highway, and predicted levels remain at or below the upper guideline value for residential amenity.

3.1.2 Expected daytime noise levels at sites within the development

Noise received at the notional boundary of proposed residential properties within the development has also been considered.

We understand that a 1.8 metre high acoustic fence is to be included around the outdoor play area of the Childcare Centre to the minimum extent as illustrated in red in figure 3.1 below. Noise rating levels can be expected in the order of 47 dB L_{Aeq} at the site boundaries of Lots 25 – 30 and Lot 203, and 50 dB L_{Aeq} at the first and second stories of buildings on Lots 25 – 30 and Lot 203.

In order to acoustically effective, an acoustic fence will need to conform to the following specification:

- Surface Mass – at least 10 kg/m²
- The fences must be continuous and maintained with no gaps or cracks. This will require timber palings to be well overlapped (25 mm minimum) or a “board and batten” system, and a sleeper rail connecting the base of the palings to the ground.

- Suitable fencing materials which are commonly used include 25 mm timber, 9 mm fibre cement, 12 mm plywood, masonry, and concrete.
- Where timber is used a paling thickness of at least 25 mm is recommended to help resist warping.

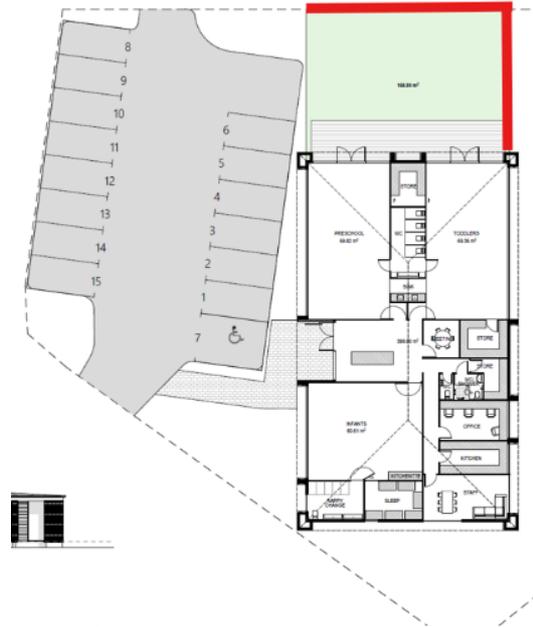


Figure 3.1 – Recommended outdoor play area fencing extent

Noise rating levels associated with activity associated with the pickleball court is predicted to be 52 dB L_{Aeq} at the site boundaries of Lots 203 and 204.

The noise rating level associated with activity associated with the pickle ball court has considered that the court will be active for less than 50% of the daytime period, allowing a -3 dB duration adjustment to be applied in accordance with NZS 6802:2008, and associated noise will exhibit impulsive sound characteristics, for which a +5 dB SAC penalty has been included.

We understand that a 2.0 metre high acoustic fence between the southern loading bay of the Market and the boundary of Lot 102 is included in the proposal. Noise from the Café and Market activities is predicted to result in levels of approximately 66 dB L_{Aeq} at upper facades of the building on Lot 102 located nearest to the loading bay. This exceeds the District Plan noise limits and the guideline values contained in NZS 6802:2008. The main contributor to this exceedance is the unloading of delivery vehicles in the southern area of the Café/Market car park, adjacent to the southern façade of the Market building.

However, as further discussed in section 4.0, noise levels from future use of adjacent State Highway are also expected to be around 65 – 66 dB L_{Aeq} (24 h) at the same locations as those affected by the delivery vehicle activity. Given that the dwellings in these locations will already need to be designed to accommodate noise levels in the order of 65 – 66 dB L_{Aeq} (24 h) to achieve suitable internal noise levels via a Resource Consent Condition relating to indoor design noise level, and that outdoor amenity will already be compromised by the highway traffic noise, it is considered that the short-term unloading activity is unlikely to result in a notable noise effect on the residential occupants of the building on Lot 102 in closest proximity to the loading area.

3.2 Noise from activities on site during the nighttime period (2000 to 0800 hours)

During the nighttime period between 2000 to 0800 hours, the expected worst case noise generating activities can be expected to include staff of the Childcare Centre and Café and Market arriving and parking

in their applicable car parks. We have based our analysis on the following level of activity, as a worst case operating scenario:

Childcare Centre:

- 5 staff parking in the Childcare Centre carpark, arriving on site before 0800 hours.

Café and Market:

- 10 staff parking in the Cafe and Market carpark, arriving on site before 0800 hours.

3.2.1 Expected noise levels received at sites outside of the development

Based on the above the expected noise at nearby boundaries are shown in table 3.2 below.

Table 3.2 – Noise levels from activities between 2000 and 0800 hours in a peak 15 minute period

Receiver location	Receiver Zone	Assessment location and limit	Expected noise levels (dB L _{Aeq})
1 Balneaves Lane	Rural Residential	Site boundary 40 dB L _{Aeq} (15min)	26
2 Balneaves Lane / 20 Albert Town-Lake Hawea Road			34
5 Balneaves Lane			24
5 Head Place			18
2 Riverbank Road	Rural Lifestyle		32
5 Riverbank Road			31
33 Old Racecourse Road	Large Lot Residential A		12
34 Old Racecourse Road			14
35 Old Racecourse Road			18

Based on this analysis, we expect the noise levels received at the boundaries of the neighbouring sites to readily comply with the District Plan nighttime noise limit of 40 dB L_{Aeq}.

3.2.2 Expected noise levels received at sites within the development

Activity during the nighttime period is expected to readily comply with the applicable nighttime noise limits at all residential / worker accommodation units within the development.

4.0 ROAD NOISE REVERSE SENSITIVITY ASSESSMENT

4.1 Traffic noise from State Highway

The site is adjacent to State Highway 6 (Wanaka – Luggate Highway and Albert Town – Lake Hawea Road) and State Highway 84 (Wanaka-Luggate Highway). We understand that NZTA will likely request a Condition for the Consent of the current application, similar to that previously approved on the on the consent order for the residential component of the previously approved development, as reproduced below:

Terrace housing units that are within or partly within 100m of the edge of the State Highway 6 and/or State Highway 84 carriageway shall be designed, constructed and maintained to achieve:

- An indoor design noise level of 40 dB L_{Aeq}(24hr) inside all habitable spaces.*

- b) *If windows must be closed to achieve the design noise levels, the building must be designed, constructed and maintained with a ventilation and cooling system. For habitable spaces the system must achieve the following:*
- i. *Ventilation must be provided to meet clause G4 of the New Zealand Building Code. At the same time, the sound of the system must not exceed 30 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser.*
 - ii. *The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser.*
 - iii. *The system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25 °C. At the same time, the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1m away from any grille or diffuser.*
- c) *A design report prepared by a suitably qualified and experienced acoustics specialist must be submitted to the Council demonstrating compliance with this condition prior to construction or alteration of any building. The design must take into account the future permitted use of the state highway; for existing roads this is achieved by the addition of 3 dB to existing measured or predicted noise levels.*

4.2 District Plan rule

We note that there is no explicit rule within the QLPDP relating to traffic noise reverse sensitivity for receivers within a Rural Zone. However, the QLPDP does contain provisions for receivers within residential zones of the QLPDP as reproduced below, and residential / accommodation uses on this site are likely to have a similar sensitivity to road noise:

Lower Density Suburban Residential: QLPDP Rule 7.5.15 *Road Noise - State Highway*

Any new residential buildings or buildings containing Activities Sensitive to Road Noise, located within:

- a. *80 metres of the boundary of a State Highway that has a speed limit of 70km/h or greater;*
or
- b. *40 metres of the boundary of a State Highway that has a speed limit less than 70km/h.*

shall be designed, constructed and maintained to ensure that the internal noise levels do not exceed 40dB $L_{Aeq(24h)}$ for all habitable spaces including bedrooms.

Medium and High Density Residential: QLPDP Rules 8.5.2 and 9.5.12 *Sound Insulation and Mechanical Ventilation*, as reproduced below:

Any residential buildings, or buildings containing an Activity Sensitive to Road Noise, and located within 80m of a State Highway shall be designed to achieve an Indoor Design Sound Level of 40 dB $L_{Aeq(24h)}$.

4.3 Other guidance

We also note the following additional guidance:

- a) The NZTA Guidance document² which states the ‘effects area’ (where sound insulation rules apply) is between 57 and 64 dB $L_{Aeq(24h)}$. No additional controls are recommended outside the effects area and therefore it is implied that, where outdoor noise levels are below 57 dB $L_{Aeq(24h)}$, the noise levels would be appropriate for residential use without further consideration.
- b) NZS 6806:2010 *Acoustics – Road traffic noise* – New and altered roads recommends an external noise criterion of 57 dB $L_{Aeq(24h)}$ for residential buildings.
- c) NZS 6806:2010 *Acoustics – Road traffic noise* – New and altered roads also notes that the effects area extends some 100 metres from the edge of the closest traffic lane.
- d) The same NZTA Guidance document states that new buildings in or partly in the State Highway buffer area (40 metres) must be designed, constructed, and maintained to achieve road-traffic vibration levels complying with Class C of NS 8176E:2005 *Vibration and shock - Measurement of vibration in buildings from land-based transport and guidance to evaluation of effects on human beings* that gives a level of 0.3 mm/s $v_{w,95}$, to adequately mitigate reverse sensitivity effects associated with road traffic vibration.

While focussed on assessments of new and altered roads, the recent NZTA *Guide to assessing road traffic noise* (dated February 2024) has the following statements which reflect the fact that traffic noise controls by necessity strike a balance between reducing noise effects and identifying what is practical to achieve for residential developments close to State Highways:

“While residual adverse effects remain unavoidable in most cases, the processes set out in this guide are designed to reduce potential noise effects of new and altered roads to at least an acceptable degree... There is not a fixed noise limit but if reasonable external noise levels cannot be achieved ten buildings are treated, if required, to achieve reasonable internal noise levels. Application of NZS 6806 is part of the assessment process required by this guide. It is used within a broader framework that also assesses potential noise effects that may occur (even when there is compliance with the NZS 6806 criteria).”

We note that NZTA Guidance document also recommends the following specification for the ventilation and cooling system:

- *Ventilation must be provided to meet Clause G.04 of the New Zealand Building Code. At the same time the sound of the system must not exceed 30 dB $L_{Aeq(30s)}$ when measured 1.0 metre away from any grille or diffuser.*
- *The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour (more than is specified in clause G.04). At the same time the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1.0 metre away from any grille or diffuser.*
- *The system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25°C. At the same time, the sound of the system must not exceed 35 dB $L_{Aeq(30s)}$ when measured 1.0 metre away from any grille or diffuser.*

Based on the guidance outlined in sections 4.1 and 4.2, we consider that the historical condition described above remains reasonable. Accordingly, it is expected that adoption of a similar condition as part of the current resource consent would also be appropriate.

As illustrated in figure 4.1 below, there are a number of residential / visitor accommodation units in the development that are located within 100 metres from the edge of the State Highway 6 or State Highway 84

² NZ Transport Agency, *Guide to the Management of Effects on noise sensitive land use near to the state highway network*. Version 1.0, September 2015

carriageway and will require further analysis to ensure that the indoor design noise level of 40 dB $L_{Aeq(24hr)}$ can be achieved all relevant habitable spaces.

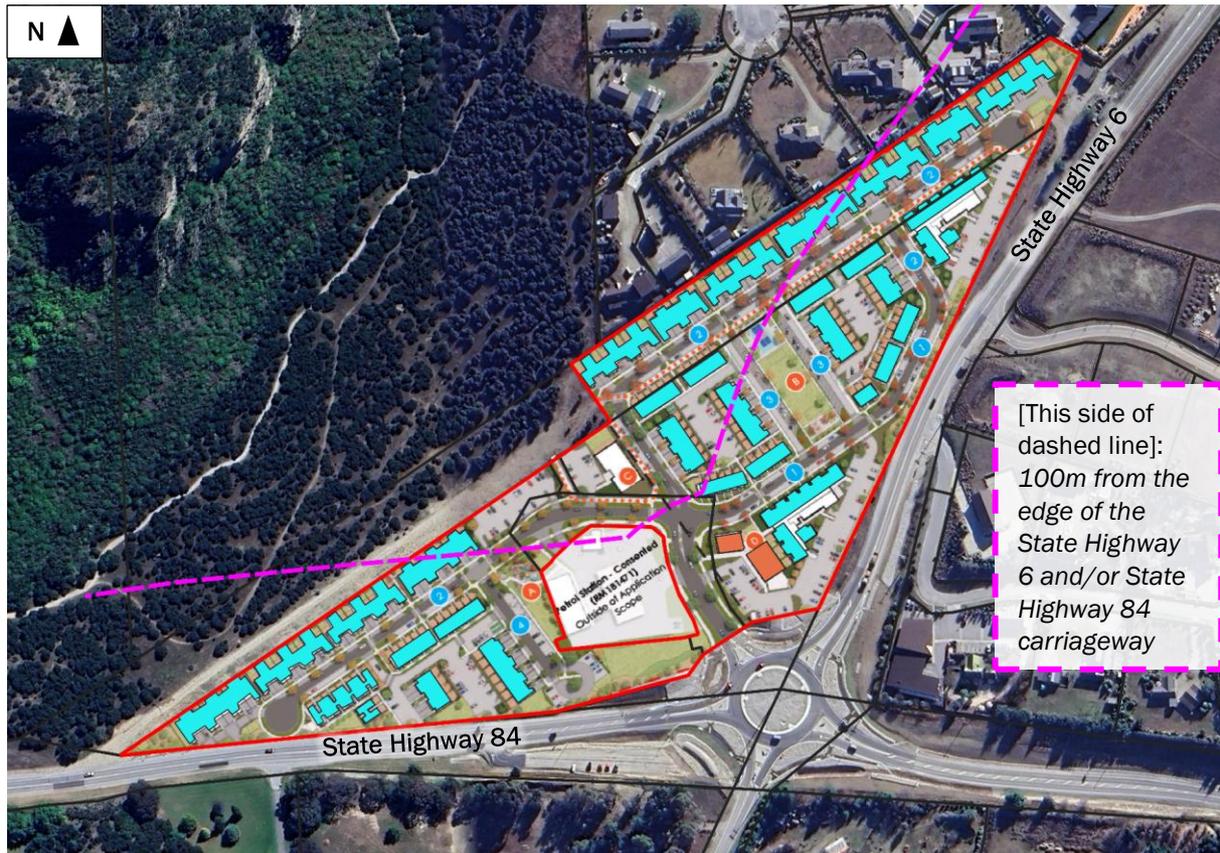


Figure 4.1 – Site proximity to State Highway 6 and State Highway 84 (image source: data.linz.govt.nz)

4.4 Expected external traffic noise levels

The expected noise levels due to vehicles travelling past the site on State Highways 6 and 84 have been calculated using the Calculation of Road Traffic Noise (CoRTN) algorithm applied with the SoundPLAN (v8.2) 3D noise modelling software.

The modelling was based on data inputs for Average Annual Daily Traffic (AADT) traffic flow volume, local terrain, local ground conditions, designated speed limit, percentage of heavy vehicles using the road and the road surface type.

The traffic flow volume for State Highway 6 was based on NZTA traffic count data (2024) from a count site on the relevant section of Albert Town – Lake Hawea Road (between Head Place and Clan Mac Road) and was adjusted using a 3% increase in traffic volume per year to 11,226. The adjusted AADT traffic flow volume used in the modelling was 3204 for both directions on State Highway 6, with the heavy vehicle flow composition being 3.3 %.

The traffic flow volume for State Highway 84 was based on NZTA traffic count data (2024) from a count site on the relevant section of Wanaka – Luggate Highway (between Sir Tim Wallis Drive and Anderson Road) and was adjusted using a 3% increase in traffic volume per year to 2025. The adjusted AADT traffic flow volume used in the modelling was 14,557 for both directions on State Highway 84, with the heavy vehicle flow composition being 3.1 %.

In accordance with the NZTA guidance for assessing road-traffic noise, 3 dB has been added to predicted noise levels to take into account future use of the state highway.

The Mobile Road database³ indicated that the road surface on the relevant section of State Highway 6 consists of double coat reseal (grade 3/5), and double coat reseal (grade 4/6) on the relevant section of State Highway 84. The noise model was configured accordingly.

Modelling also considers existing buildings and proposed structures on the site and adjacent sites, and the terrain of the surrounding area. We assumed that proposed buildings on the development site will be constructed at approximately the same time and have considered each proposed building in the traffic noise model.

Our modelling indicates that the expected external sound pressure levels incident on residential buildings located within 25 – 35 metres of State Highway 6 range from 66 – 69 dB $L_{Aeq(24\text{ h})}$ at the most exposed façade elements (southeastern).

Sound pressure levels incident on buildings located within 10 – 20 metres from State Highway 84 range from 72 – 76 dB $L_{Aeq(24\text{ h})}$ at the most exposed façade elements (southeastern).

Sound levels incident on buildings located further from both State Highways (but within the 100-metre NZTA threshold) range from 55 – 66 dB $L_{Aeq(24\text{ h})}$ at the most exposed façades, with lower levels of the range expected where buildings benefit from acoustic shielding provided by those in front relative to the road.

Based on the above external noise levels, we expect that habitable spaces can be practically constructed to achieve a 40 dB $L_{Aeq(24\text{ hr})}$ internal noise level requirement, but in some instances upgrades beyond standard building envelope constructions will be necessary.

This will likely require an upgraded building envelope providing external-to-internal noise reduction of approximately 32–37 dB for buildings closest to State Highway 84, and 26–31 dB for those closest to State Highway 6. Less stringent upgrades are expected to be sufficient for buildings located further from either highway or those benefiting from shielding by other buildings.

A Condition requiring review of the final building designs at Building Consent stage of the project would be appropriate, to ensure compliance is achieved.

5.0 CONSTRUCTION NOISE

Rule 36.5.13 *Construction Noise* of the QLPDP will apply to construction activities associated with the development and is reproduced below.

Construction sound must be measured and assessed in accordance with NZS 6803:1999 Acoustics – Construction Noise. Construction sound must comply with the recommended upper limits in Tables 2 and 3 of NZS 6803. Construction sound must be managed in accordance with NZS 6803.

NZS 6803:1999 *Acoustics – Construction Noise* provides noise limits for construction activities for three durations. This is because higher noise levels are more tolerable for short term activities as opposed to those of a more permanent nature. The duration of work is for the total construction activity on the site as opposed to a specific activity, therefore for this activity we would expect the ‘long-term duration’ (more than 20 weeks) to apply.

³ <https://mobileroad.org/desktop.html>, viewed 25th February 2025.

Table 5.1 – Noise limits outlined in NZS 6803:1999

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L _{eq}	L _{max}	L _{eq}	L _{max}	L _{eq}	L _{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

Provided that no rock breaking is required (or other activities with a similar sound power such as sheet piling), we expect that where best practicable options for noise avoidance or mitigation should be applied to construction activities, noise from construction within the site can achieve the long-term duration noise limits of NZS 6803:1999.

To ensure that the best practicable option to mitigate noise is adopted, we recommend that a Construction Noise and Vibration Management Plan (CNVMP) is implemented.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Noise from all sources expected to be associated with all non-residential activity of the Mt Iron Junction mixed use development at 237 Wanaka – Luggate Highway, in Wanaka, have been considered.

Based on our review of national and international guidance, the operative Queenstown Lakes District Plan daytime noise limit of 50 dB L_{Aeq} and nighttime limit of 40 dB L_{Aeq} / 75 dB L_{AFmax} for the relevant zones are more restrictive than the upper guideline limits recommended by WHO and NZS 6802. We therefore consider that compliance with the operative District Plan noise limits at the notional boundary of any residential unit of the development, within the Rural Zone, and site boundaries of dwellings within Rural Residential, Rural Lifestyle, or Large Lot Residential A zone will be appropriate to ensure noise effects are minimal.

Where daytime noise levels exceed the District Plan limits but remain below the upper guideline value of 55 dB L_{Aeq}, this noise would also be expected to have minimal effect when received at nearby boundaries of noise sensitive properties – particularly those that are already exposed to existing traffic noise levels that are higher than this. For locations within the application site where elevated noise levels are expected but the receiver is already exposed to existing traffic noise of a similar order (and includes mitigation to reduce internal noise levels), noise effects may also be minimal.

Noise levels outside the development site are generally predicted to comply with the QLPDP noise limits, except daytime noise levels at the boundary of the site containing the church at 1 Balneaves Lane (52 dB L_{Aeq}) and the veterinary clinic at 2 Balneaves Lane / 20 Albert Town-Lake Hawea Road (55 dB L_{Aeq}). We

expect this to have minimal noise effect, primarily because these locations are already exposed to elevated traffic noise levels, and predicted levels remain below the upper guideline value for residential amenity.

There are other sites within the development that could receive daytime noise levels above the District Plan noise limits. This includes noise from the pickle ball court received at Lots 203 and 204. As noise levels remain below the upper guideline limits for residential amenity, we consider that noise effects at these locations will be minimal.

Delivery noise from the Café and Market activities may also result in levels of approximately 66 dB L_{Aeq} at upper facades of the building on Lot 102 located nearest to the loading bay. However, noise levels from future use of the adjacent state highway are expected to be of a similar order at this location at times. We have recommended a condition requiring the sound insulation provided by this building to be upgraded to control traffic noise, and so it is considered that the short-term unloading activity is unlikely to result in a notable noise effect on the residential occupants of the building on Lot 102.

To give confidence that noise emissions associated with the activity are maintained at appropriate levels, and noise from the State Highways will be appropriately controlled inside noise sensitive buildings, we recommend the following with regard to the best practicable options for noise control on this site:

- The Childcare Centre, and Café and Market will only operate, and allow deliveries between 0800 and 2000 hours.
- Use of the pickle ball court should be limited to use between 0800 and 2000 hours.
- We recommend the installation of a 1.8 metre high acoustic perimeter fence along the full northern and eastern boundaries of the play area of the proposed Childcare Centre to the minimum construction specifications as outlined in section 3.1.2.
- We recommend the installation of a 2.0 metre high acoustic barrier between the southern loading bay of the Market and the boundary of Lot 102 to the minimum construction specifications as outlined in section 3.1.2.
- We recommend a Condition requiring review of final building designs at Building Consent stage, with regard to break-in from traffic noise, to ensure internal noise levels within dwellings meet 40 dB $L_{Aeq(24hr)}$.
- We recommend that a Construction Noise and Vibration Management Plan (CNVMP) is implemented for the development.

Please do not hesitate to contact us if you have any queries.

Kind regards,



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